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BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, DC 20268-0001

Statutory Review of the System for Regulating Rates and Classes for Market Dominant Products

Docket No. RM2017-3

DECLARATION OF LYUDMILA Y. BZHILYANSKAYA FOR THE PUBLIC REPRESENTATIVE

(March 20, 2017)

1. AUTOBIOGRAPHICAL SKETCH

My name is Lyudmila Y. Bzhilyanskaya. I am a Senior Econometrician for the Postal Regulatory Commission (PRC), where I have been working since 2011. I hold a Ph.D. in Economics and have extensive analytical experience in both academics and consulting. I have received prestigious scholarships and grants including research grants from the John D. and Catherine T. MacArthur Foundation, Carnegie Foundation, British Council, British Academy and Maison des Sciences de l'Homme. As a visiting scholar, I conducted individual and collaborative research at Georgetown University, University of Sussex (UK), University of Birmingham (UK) and Ecole Polytechnique (France). I have published more than forty research papers related to the economic aspects of technological development, postal economics, econometric modeling and input-output analysis. Most of my consulting experience has been in the fields of transportation (presentations and reports for the U.S. Federal, state and local transportation authorities) and laser industry (economic and sociological studies for the International Laser Association). As a consultant I have been involved in economic benefit analysis, econometric modeling, economic forecasting and data analysis, as well as the development and analysis of surveys.

2. PURPOSE AND SCOPE OF DECLARATION

In December of 2016, I was assigned as a member of a technical team to assist the Public Representative in this docket with the economic and technical issues related to the "review of the market dominant ratemaking system as required by 39 U.S.C. 3622."[1] Order No. 3673 established "the beginning of the Commission's statutory review of the ratemaking system" and appointed a Public Representative "to represent the interests of the general public in this proceeding." *Id.* at 2, 12. As mandated by the Postal Accountability and Enhancement Act (PAEA), the Commission, in its review, will determine whether the system "is achieving the objectives, taking into account the factors, established by Congress." *Id.* at 1; *see also* 39 U.S.C. 3622(d)(3).

In Order No. 3673, the Commission identified objectives and presented preliminary definitions for these objectives, as well as concepts for their potential measurement. Order No. 3673 at 3-10. I have conducted analytical research regarding Objective 1, "[t]o maximize incentives to reduce costs and increase efficiency." 39 U.S.C. 3622(d)(3).

As the Commission explained in Order No. 3673, Objective 1 includes "three measurable key concepts" – maximization of incentives, reduction of costs and increases in efficiency. Order No. 3673 at 4. My research, which provides the basis for this declaration, was primarily related to the "increase efficiency" concept. In its preliminary definition of Objective 1, the Commission differentiates between operational and pricing efficiency. *Id.* Such a view on efficiency is reasonable, as it reflects a position of the Postal Service or regulator exploring the field of potential regulatory mechanisms or measures (*i.e.* operational or pricing) that could increase efficiency. There is, however, another – and probably more primary - layer in the concept of "increase efficiency." The Commission's definition focuses on *how* to increase efficiency, a priori assuming that it is clear (or almost clear) "*what"* to increase. The layer that is left out in the provided definition is related to the very understanding of what

[1] Advance Notice of Proposed Rulemaking on the Statutory Review of the System for Regulating Rates and Classes for Market Dominant Products, December 20, 2016 at 12 (Order No. 3673).

it means for the Postal Service to be efficient or inefficient. In such regard, a number of important questions arise. What factors determine efficiency, and therefore must be captured by the efficiency measure(s)? What are indicators (criteria) that would allow comparison of the efficiency in different years? Should efficiency be assessed differently in the short-run and in the long-run? And finally, do the current measures of efficiency adequately reflect the efficiency of the Postal Service? Each of these questions might be considered for a separate study, and in this declaration, I will try to address each of them to some extent.

3. USE OF TOTAL FACTOR PRODUCTIVITY TO MEASURE EFFICIENCY

In Order No. 3673, the Commission suggested that "[m]easuring operational efficiency could involve reviewing trend analyses of total factor productivity." *Id.* at 14. As the Postal Service indicates on its website https://about.usps.com (citing its Comprehensive Statements on Postal Operations), the total factor productivity (TFP) index is a "broad measure of longer-term productivity trends," and provides a "historical measure of efficiency."[2] The Postal Service describes TFP as a measure of "operational efficiencies," which include enhancing "operational performance and increasing customer value."[3] TFP was developed to capture "changes in the *amount of output* that can be produced by a *given quantity of inputs*."[4] Since the adoption of the TFP metric by the Postal Service in 1985, the TFP theory and calculation methodology has been outsourced to the Christiansen Associates consulting firm.[5] Its founder, Laurits Christiansen, co-authored a number of papers devoted to productivity indexes

[2] *See* United States Postal Service 2013 Annual Report to Congress, FY 2013 Comprehensive Statement on Postal Operations at 56 (FY 2013 Comprehensive Statement). Available at: *https://about.usps.com/publications/annual-report-comprehensive-statement-2013/welcome.htm;* 2005 Comprehensive Statement at 63 (FY 2005 Comprehensive Statement). Available at: https://about.usps.com/strategic-planning/cs05/contents.htm

[3] Docket No. ACR 2016, Library Reference USPS-FY16-17, United States Postal Service FY2016 Annual Report to Congress, Part 2 – FY2016 Comprehensive Statement on Postal Operations at 50. (FY 2016 Comprehensive Statement).

[4] Hulten, Charles R., "Total Factor Productivity. A Short Biography", *New Developments in Productivity Analysis*: University of Chicago Press, 2001 at 40. Available at: http://www.nber.org/chapters/c10122.pdf (Emphasis added).

[5] https://www.lrca.com/area-of-expertise/productivity-analysis/

and their application to regulated industries and firms, including the Postal Service.[6] Per its definition, TFP of a firm, industry or a group of industries, is a ratio between a measure of real output produced and a measure of real input used over the same time period.[7]

It is important to note that the output in service industries is measured differently than the output in goods-producing industries, and the problems associated with its measurements are well known.[8] As a producer of services, the Postal Service has a broad spectrum of outputs, which primarily include "mail volumes and servicing an expanding delivery network."[9] The workload plays an important role in measuring the output for the TFP index. For example, to develop a measure of volume (*i.e.,* weighted mail volume measure), the Postal Service weights each mail type "according to its workload content." *Id.* The workload itself is comprised of multiple factors (weight, size, mode of transportation etc.). When the Postal Service discusses TFP, it sometimes identifies the workload with output. Thus, the Postal Service states that by applying the TFP, it seeks to assess "how effectively …[it] uses resources (inputs) to handle [the] workload," which includes weighted mail volume, delivery points and miscellaneous [direct] output (such as passports).[10] Inputs (or resources) included in the TFP measure, consist of the labor, capital and materials. *Id*.

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[6] *See e.g.,* Caves, Douglas W., Christensen, Laurits R. and Diewert, W. Erwin, "Multilateral Comparisons of Output, Input, and Productivity Using Superlative Index Numbers," *The Economic Journal, Royal Economic Society*, March 1982 at. 73-86; Caves, Douglas W. and Christensen, Laurits R., "The Relative Efficiency of Public and Private Firms in a Competitive Environment: the Case of Canadian Railroads," *Journal of Political Economy,* Vol. 88, No. 5 (October 1980) at 958-976.

[7] *See* Christensen Laurits R. and Jorgenson, Dale W., "US Income, Saving and Wealth, 1929-1969," *Review of Income and Wealth,* Series 19, No. 4 (December 1973), at 329; Diewert Ervin, "The Challenge of Total Factor Productivity Measurement," Centre for the Study of Living Standards, *International Productivity Monitor*, Number 1, Fall 2000 at 1. The word "real" in the quoted definition indicates that both the output and the input are measured in constant prices.

[8] For problems associated with measuring output in the service industries *see e.g*., Mark, Jerome A., "Measuring Productivity in Service Industries", *Monthly Labor Review*, June 1982 at 3-4.; Hill T.P., "On Goods and Services," *The Review of income and Wealth",* 1977, Series 23 at 315-338.

[9] *See e.g.,* FY 2005 Comprehensive Statement at 63.

[10] FY 2016 Comprehensive Statement at 50, 52.

The Postal Service files its TFP Tables as annual reports, and they are available on the Commission's website.[11] Each report includes historic TFP data back to 1963. To illustrate the productivity changes over the years, the Postal Service analyzes the cumulative TFP trends since at least as far back as 1972.[12] Historic TFP indexes (and, as a result the cumulative TFP trends) are often updated based on the most current data. Such updates are due to the periodic revisions of data performed by the Postal Service, as well as other agencies.[13]

In respect to TFP as a measure of the Postal Service's efficiency, I make a number of observations and provide some suggestions, as summarized below.

4. RECOMMENDATIONS ON MEASURING EFFICIENCY

A. Presentation of Total Factor Productivity Data Requires Better Transparency

The Postal Service's annual filings should include more transparent information related to the TFP indexes.

First, currently, the Postal Service files its TFP Tables as a periodic report in the form of an Excel spreadsheet.[14] The Postal Service's filing contains a short letter to accompany the spreadsheet, but does not include any documentation with an explanation of the methodology underlying the tables and calculated indexes. I strongly believe that the Postal Service should provide a methodological description for its

[11] *See e.g.,* USPS Annual Tables, FY 2015 TFP (Total Factor Productivity), March 1, 2016 (FY 2015 TFP Tables). *See also,* USPS Annual Total Factor Productivity Data, 1963 – 1988, June 12, 1989. The workpapers related to the most recent (FY 2016) TFP are available in Docket No. ACR 2016, Responses of the United States Postal Service to Chairman's Information Request No. 3, Question 2, January 13, 2017, file "ChIR.3.Q.2.FY16.TFP.xlsx."

[12] *See* 2013 Report on Form 10-K United States Postal Service, November 15, 2013. Available at: https://www.prc.gov/Docs/88/88279/2013_USPS_%20FORM_10K_FINAL.pdf

[13] For example, after the Bureau of Labor Statistics and Bureau of Economic Analysis revise their price indexes, they must be incorporated into TFP calculations, which would affect historic TFP measures. *See* FY 2005 Comprehensive Statement at 63; FY 2016 Comprehensive Statement at 50, 52.

[14] Starting with FY 2014 annual TFP Tables, The Postal Service files two versions of the TFP report – public version and non-public version. The latter "contains information pertaining to competitive products that the Postal Service believes is commercially sensitive." *See* USPS Annual Tables, FY 2014 TFP (Total Factor Productivity), file "Letter_TFP_FY14_20150130171703.pdf", January 30, 2015 at 1.

annual TFP tables, similar to the documentation already available for some other periodic reports, including the Cost and Revenue Analysis (CRA) report or the Market Dominant Demand Analysis.[15] Such a provision is especially relevant considering that methodology for TFP indexes was developed more than 30 years ago. In 1990 (approximately five years after the adoption of TFP efficiency measures by the Postal Service), the Commission staff performed a comprehensive TFP study. This study is available on the Commission's website, but in the Rate Commission Archives, which are not easily accessible by interested parties and general public.[16] In addition, how relevant the conclusions of the 25-year old PRC TFP Study are to the current TFP measures is still a question. However, no up-to-date study or methodological documentation is currently available on the Commission's website.

Second, the Postal Service's TFP filings contain a significant number of separate worksheets. For example, in FY 2015, the number of worksheets exceeded ninety.[17] Each worksheet provides different types of data and usually contains more than one index for any particular year. At the same time, the Postal Service's filing does not include any roadmap that would provide some guidance on the reported data. Each worksheet has a name (label), which, with the exception of the cover worksheet, is abbreviated (*e.g*. as "Cur-2a", "Lab-4", "Out-42b"). Short table titles (or column headings) do not clearly indicate what data corresponds to the efficiency factors or TFP indexes. Thus, in the FY 2015 TFP Report, worksheets "Lab-7" and "Lab-8" include data labeled "hours," "value," "price" and "quantity."[18] Some data is reported under a more general title, such as "composition" or "total index." There are two worksheets specifically labeled "Tfp-47" and "Tfp-48." Data in worksheet "Tfp-48," for example,

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[15] *See* "Summary Description of USPS Development of Costs by Segment and Components. Fiscal Year 2015," July 7, 2016; "Narrative Explanation of Econometric Demand Equations for Market Dominant Products as of November 2015," United States Postal Service, July 7, 2016.

[16] *See* A Study of U.S. Postal Service Productivity and its Measurement, Staff Study, Postal Rate Commission , May 9, 1990 (1990 PRC TFP Study), Volume 1 and 2. Available at https://www.prc.gov/dockets/archives

[17] *See* FY 2015 TFP Report, file "Table Annual 2015 (2015 CRA) public."

[18] FY 2015 TFP Report, file "Table Annual 2015 (2015 CRA) public," worksheets 'Lab-7' and 'Lab-8'.

includes multiple indexes under the title “Factor Inputs.” Without special knowledge, it is very difficult (if not impossible) to reveal any connection between data reported in different worksheets, and sometimes even in the same worksheet. All data in worksheets are hardcoded, which makes the analysis of the data even more complicated. Also, it appears practically impossible to provide any reasonable interpretation of indexes (without simple guessing). Inclusion of an additional related explanation (with the relevant definitions and sources for the reported data) would provide the general public with at least some guidance on the data reported in the numerous TFP worksheets.

Third, while the cover page (worksheet) of the spreadsheet indicates that these are the TFP Tables “including FY 2015 CRA and ICRA,” none of the worksheets provide any information regarding a connection (*e.g.* in the form of links or actual references) to the Postal Service’s CRA or ICRA reports. Without such a connection, it is very difficult to understand how the TFP data is related to the CRA/ICRA reports.

Fourth, the data and indexes reported in the annual TFP tables do not have any evident relation to the TFP indexes provided by the Postal Service in its Annual Report to Congress. In its Statement on Postal Operations (which is part of the Annual Report to Congress) the Postal Service provides the aggregated cumulative total factor productivity index, and also sometimes provides the aggregated annual TFP index.[19] It is not clear from the Postal Service’s annual TFP Tables which of the multiple reported indexes represents the aggregated TFP index, and whether it is included at all. It appears that it would be useful to clearly identify ties between the data in TFP Tables and the two aggregated TFP indexes (*i.e.,* cumulative and annual) reported in the annual Statement of Postal Operations. By providing such additional information the Postal Service would significantly enhance the transparency of its TFP reports.

[19] *See* FY 2016 Comprehensive Statement at 50, 52; FY 2005 Comprehensive Statement at 63-64.

B. Limitations of Total Factor Productivity as a Measure of Efficiency and Areas of Improvement

I also hold some reservations regarding the utilization of TFP as an exhaustive measure of efficiency. By comparing output with input, TFP primarily serves as a measure of productivity or *productive efficiency,* which is defined as "achieving as much output as possible from a given amount of inputs or resources."[20] The major question that arises here is whether there are any other types (aspects) of efficiency that are not fully reflected by the TFP metric, but are still important for the Postal Service. These other aspects of efficiency include, but are not limited to, scale, allocative and dynamic efficiency.[21] In Order No.3673, the Commission acknowledges that pricing methods that promote allocative efficiency are different from pricing methods that promote productive efficiency. Order No. 3673 at 4, n.14. Although there is no Chinese wall between different types of efficiency, it is still reasonable to assume that some aspects of efficiency "escape" from the TFP measures.

Dynamic or technical efficiency, for example, has been traditionally associated with technological progress and product innovations.[22] Although, theoretically, TFP is designed to measure the effect of technological progress, technological changes are not "confined to productivity [improvements] in physical equipment."[23] Technological progress often occurs during a significant period of time and might not be adequately captured by TFP measures. As innovations do not necessarily lead to immediate productivity growth, the economic impact of technological improvements might not be visible for a number of years after the investments are made. Moreover, in the research literature, there has been an interesting observation "that a firm subject to regulatory

[20] Colander David C., "Microeconomics": Irwin, McGraw Hill, 5th Edition, 2004 at 27.

[21] For more information about different types of efficiency in the postal sector in European countries (including the applicable legal requirements) *see, Comparative* Working Methods for Considering Efficiency of Postal Operations, ERGP Report, 2016 at 16-21 (2016 ERGP Report).

[22] 2016 ERGP Report at 14,16.

[23] Caron, William M., "Introduction", *Technological Changes in Regulated Industries* (Ed. By Capron, William M.): Brookings Institution, 1971 at 1.

constraint might find it profitable to be *technologically inefficient*."[24] To what extent in the regulated industry (and, specifically to the Postal Service), such potential inefficiency is compensated by increasing returns to scale is an important question that provides an additional subject for research.

Annual TFP indexes focus more on short-term productivity and do not always consider long-term productivity, which is better reflected by cumulative TFP indexes or TFP trends. However, whether a cumulative TFP index is able to measure dynamic efficiency is still a question that requires special attention. Research has been done to develop measures of TFP growth that would provide a long-term view of productivity and capture dynamic efficiency. The conventional TFP measures originate from Solow, who employed certain assumptions for his productivity growth theory.[25] Specifically, Solow assumed neutral technical progress and constant return to scale. *Id.* at 317, 320. More recent studies of productivity growth measures released Solow's assumptions. One of the main ideas underlying these studies was to provide a decomposition of factors responsible for TFP growth to distinguish between the scale-related components (that lead to a proportional growth) and other factors that affect a dynamic growth (and are often associated with a presence of inefficiency, at least in the short run).[26] The results of such studies appear to be very useful and require special consideration.

Also, the current methodology for calculating TFP efficiency measures for the Postal Service is based on the production function approach. The price for inputs in this production function is usually exogenous, meaning that it is out of the Postal Service's control. For example, data on inputs is obtained from the Bureau of Labor Statistics or Bureau of Economic Analysis. Some researchers question the validity of "exogeneity of input prices" assumptions in regard to the postal sector, and propose to use a different

[24] Westfield, Fred M., "Innovation and Monopoly Regulation (1971), *supra* n. 23 at 25. (Emphasis added)

[25] Solow, Robert M., "Technological Change and the Aggregate Production Function," *The Review of Economics and Statistics*, Vol. 39, No. 3 (Aug., 1957), pp. 312-320.

[26] *See e.g.* Rungsuriyawiboon, Supawat and Stefanou, Spiro E.,"Dynamic Efficiency Estimation: an Application to US Electric Utilities," *Journal of Business and Economic Statistics*, Vol 25, No. 2 (April 2007), 226-238.

function that allows releasing an exogeneity assumption.[27] They argue that a so called "input distance function" would capture the returns to scale and allow the measurement of allocative efficiency. *Id*. at 6-9. Taking into account that the most recent comprehensive review of the TFP methodology goes back to 1990, it would be especially beneficial for the Commission to perform a new TFP study, considering both the relevant research that became available in the last 25 years and the current practical realities.

Additional suggestions to improve TFP efficiency measures include exploration of alternative indexing procedures. For example, the Postal Service's aggregated TFP index employs the Thornqvist indexing formula.[28] Thornqvist (or translog) indexes are "weighted geometric averages of growth rates for the microeconomic data (the quantity or price relatives)."[29] Other well-known indexes (primarily, Laspeyres, Paasche and Fisher indexes) can provide reasonable alternatives to the Thornqvist index for the TFP aggregation indexing procedure.[30] In 1982, prior to adoption of the TFP measure by the Postal Service, Laurits Christiansen co-authored a paper that compared different indexes. He concluded that the Thornqvist-Theil-translog index is very attractive for making "bilateral output, input and productivity comparisons."[31] Since all these indexes have their pros and cons, special tests were developed to help with selection of the most appropriate indexing method.[32] The 1990 PRC Productivity Study agrees that the Tornqvist indexing procedure employed by Christensen Associates is appropriate,

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[27] Banos-Pino, Jose and Rodriguez-Alvarez, Anna, "Estimating Technical and Allocative Efficiency by Means of a Bayesian Approach: an Application to the Postal Sector", Conference Paper, February 2015 at 4. Available at: https://www.researchgate.net/publication/291115601

[28] *See e.g.* Fuss, Melvyn A., "Report to the Postal Rate Commission on the Measurement and interpretation of Total Factor Productivity Growth for the United States Postal Service," April 9, 1990, PRC Productivity Study, Volume 2, Appendix A at 1, 21-22, 25-26.

[29] Diewert, W. Erwin, Nakamura, Alice O., "The Measurement of Productivity for Nations", *Handbook of Econometrics*, 2007, Volume 6, Part 1, Chapter 66 at 4522.

[30] *Id.* at 4516-4520; 1990 PRC TFP Study, Volume 2, Appendix A at 18-26.

[31] Caves (1982) at 73-86, *supra* n. 6.

[32] Diewert (2007) at 4523-3525, *supra* n. 29.

although it suggests that the Fisher index has a certain practical advantage when a product (not available in year *t-1*) is introduced in year *t*.[33] Considering that this situation is not at all uncommon, it would be useful to revisit the methodology for a TFP aggregation indexing procedure.

In regard to TFP measures, I have identified a few additional concerns that seem to be especially relevant to the Postal Service. As stated in the literature, innovations that result in new goods or improvements in the quality of products are "not part of the TFP story."[34] When a new postal product is introduced in a particular year, the comparison of TFP measures over the years requires certain adjustments. Such adjustments are also necessary when a product is transferred from the market dominant to the competitive product category. It is reasonable to assume that there is always a little room for subjectivity in the underlying adjustment methodology.

In addition, it is quite doubtful that the measures of TFP growth always properly capture changes in the quality of the measured postal services. This concern applies to both the officially disclosed quality changes (such as changes in service standards) and any "hidden" degradation of services. Presumably, inputs used in calculation of TFP indexes are adjusted for quality changes.[35] However, outputs are not necessarily subject to such adjustment, and this makes the analysis of TFP growth less reliable. Going further, it is important to keep in mind that a broader view of the Postal Service's efficiency would assume the "efficient provision of universal postal service."[36] In that regard, adequate measures would reflect efficiency not only from the supply (provider of services) side, but also from the demand (consumer of services) side. Another angle of a broader view on the Postal Service' efficiency or just productivity growth would include a comparison between the Postal Service's productivity growth and the growth of the

[33] 1990 PRC TP Study, Volume 1 at 1 and Volume 2, Appendix A at 28.

[34] Hulten (2001) at 27, *supra* n.4.

[35] Gordon, Robert, "US Economic Growth is Over: the Short Run Meets the Long Run", The Brookings Institution. *Growth, Convergence and Income Distribution: The Road from the Brisbane G-20 Summit* at 192.

[36] 2016 ERGR Report at 57.

private-sector operators.[37] The Postal Service does provide a basis for such a comparison by reporting Output per Workhour indexes and Multifactor Productivity indexes (in both annual and cumulative form).[38]

5. CONCLUSION

In Order No. 3673, the Commission identified three "measurable key concepts" within Objective 1, "to maximize incentives to reduce costs and increase efficiency." Order No. 3673 at 4. These key concepts ("maximize incentives", "reduce costs" and "increase efficiency") form a triangle where the vertexes (the concepts themselves) and the sides (that tie the concepts together) are equally important. To determine whether the Postal Service achieved Objective 1, as required by 39 U.S.C. 3622(d)(3), the Commission has to consider all of these three concepts in collaboration. The Commission's classification of efficiency into operational and pricing reflects the view of a postal operator (or regulator) who attempts to explore alternatives (such as pricing incentives or operational decisions) that would promote efficiency. It is important, however, to revisit the very concept of efficiency in order to determine what it means for the Postal Service to act efficiently, and whether all the factors that define efficiency are captured by the efficiency measures.

This declaration partially reveals the issues underlying the "increase efficiency" concept, specifically with regard to the Postal Service primary efficiency measure – Total Factor Productivity. Considering the number and complexity of issues I identified in regard to the annual TFP reports, I strongly believe that the presentation of TFP data requires much better transparency. Also, considering that the most recent Commission TFP study goes back to 1990, it is important to perform a new study that would incorporate the extensive amount of research literature that became available during more than the last 25-years. Current practical realities are not the same as they were in 1985, when the TFP measure was adopted. Significant changes in mail structure, service quality and postal operations, as well the tremendous increase in electronic

[37] *See e.g.*, Michael Schuyler, "Seven Good Years of Postal Service," *IRET Congressional Advisory,* N. 229 at 1, 4-5. Available at: http://iret.org/pub/ADVS-229.PDF

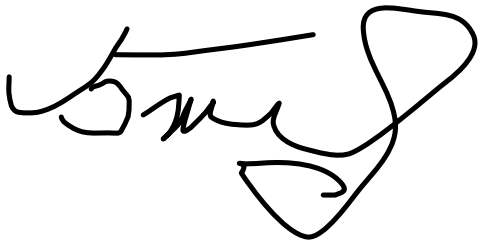
[38] FY 2005 Statement of Postal Operations at 64.

substitution of mail must have had a significant impact on efficiency. How well these changes were captured in the Postal Service's efficiency measures (and specifically by the TFP measure), is still an open question. In this declaration, I try to identify some concerns regarding the limitations and suggest potential improvements to the TFP measure.

Potential areas of immediate improvement to TFP measures include exploration of alternative indexing procedures or modeling functions, as discussed above. Probably more complicated, but not less important, issues are related to the ability of TFP measures to reflect different aspects of efficiency, which are beyond productive efficiency (*e.g.* dynamic efficiency, allocative efficiency). In the face of rising competition it is also important to have a measure that would allow comparing efficiency of the Postal Service with efficiency of its private-sector competitors. Views of efficiency from both the demand and supply side are also very important.

VERIFICATION

I, Lyudmila Y. Bzhilyanskaya, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. Executed on March 20, 2017.



Lyudmila Y. Bzhilyanskaya